



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE AMERICAN NATURALIST.

VOL. XX.—DECEMBER, 1886.—No. 12.

THE SCALLOP AND ITS FISHERY.

BY ERNEST INGERSOLL.

THOUGH it had long previously been enjoyed by the shore-towns in New England, the introduction of the scallop as an edible into the New York markets is as recent as 1858 or '59. Now the annual product of the fishery, which is restricted in area and subject to much variation, amounts to something like 75,000 gallons in all, worth from twenty-five to thirty thousand dollars at first cost; and New York receives and dispenses about three-fourths.

The species of scallop in question is *Pecten irradians*, which is common in suitable places all along our coast. Besides this there are half a dozen other varieties, living at more or less depths, in the western Atlantic, one of which, the great *Pecten tenuicostatus* of the coast of Maine and the Bay of Fundy, was formerly highly valued by the people of that region, but now is too scarce to appear on the tables of even "the rich" except at rare intervals.

The fishery and methods of preparation for market of our scallops present several features of general interest, and I believe that in my study of the matter, a few years ago, as an agent of the Census Bureau, I was able to learn some new and suggestive particulars as to the habits of the mollusk.

Though occurring in a scattered way far to the northward, it is only between Cape Cod and New Jersey that any commercial scallop-fishery exists, save at a few points on the Southern coast, as at Morehead City, N. C., for a small local trade. Even along this limited extent the fishing is not continuous, but can be followed with regularity only in restricted areas of Buzzard's bay, Mass., Narragansett bay, R. I., in Peconic bay at the eastern

end of Long Island, and at a few minor points on the New Jersey coast. Long Island sound, New York bay, Sandy Hook and much of the Jersey shore, have been so thoroughly depopulated that any fishery for scallops there has been abandoned. Occasionally a supply appears at this or that point, but uncertainly and temporarily. I was told, for example, by the oyster-planters on the north shore of Long Island, that scallops were tolerably plentiful there (particularly at Northport) once in five years. Such a statement is puzzling, and leads to a study of the habits of the scallop in search of an explanation.

The proper home of this species (*P. irradians*) seems to be in fairly deep water on a firm bottom—either sand or tough mud; yet in many localities grassy beds (*i. e.*, eel-grass—*Zostera*) are resorted to by it, especially when young. The general habits and behavior of our American scallops, such as living in companies or “schools,” moving about and darting to the surface of the water by a quick opening and shutting of the shells, to sink down again along an inclined plane forward, are familiar to all readers of natural histories, and closely similar to those of the European “St. Jacob’s shells.”

The spawn of our scallop is thrown out in early summer, and so much of it as becomes fertilized and is able, “catches” or “sets” on stones, sea-weeds and other firm supports, from the sheltered tide-pools down to a considerable depth. By the middle of July this “seed” is about as large as the head of a lead pencil, and it does not drop from its support for two weeks or more. The growth is so very rapid that the young scallops have attained about half their size by the time cold weather checks their advancement.

In November the young scallops, spawned the previous June, will be found in great numbers all along the clean shores of Narragansett bay from an inch to an inch and a half in diameter, and moving about very actively. Where eel-grass grows in great quantities, however, the young keep among it, clinging to the stalks until by their weight they bend them down to the bottom or break them off, and are swept away with the grass when it goes adrift in the fall. Should such a tenanted raft of sea-weed drift into a bay and rest there, as frequently occurs in Long Island sound, that spot will be colonized with scallops, even where none had existed before.

Great numbers, however, forsake the protection of the eel-grass when old enough, and go "dancing" about the neighborhood till they hit upon the right kind of bottom, when they come to anchor, and stay there unless driven away by extraordinary winter storms. Under such an accident thousands of bushels may sometimes be driven upon the beach, where all are pretty sure to die by freezing. Referring to this point a Sag Harbor man told me that if possible, when driven before a storm, they will work to windward, and he assured me that he had seen them swimming in schools ten feet deep. These movements are all within narrow limits, however, for the restricted bounds of the fishing-grounds are pretty nearly the same from year to year, though often it is impossible to see why the scallops should not extend their range. The young are far more active and swift than the older mollusks. Late in the fall, however, there is reported to be a regular migration of adult scallops toward the shore, whereupon the fishing begins; but this statement is not well substantiated, I fear.

The size of the young scallops is little increased during the colder months, but in the spring a new period of speedy growth begins and maturity is said to be reached within a year. At any rate these mollusks will produce spawn in the June following their birth, and are ready for market the subsequent autumn. The rapidity with which they enlarge their bulk, but more especially their fatness, or proportion of flesh to shell, is remarkable. Thus a bushel of these mollusks will yield only about two quarts of "meats" in October, whereas a bushel from the same locality at Christmas will turn out a gallon.

The fishermen believe that scallops never spawn but once, and die before they reach the age of three years. I am not at all sure this is a fact to the extent alleged, but if so it presents a case where the generations follow one another so closely that there are never two ranks or generations in condition to reproduce at once (except in rare individual instances), since all, or nearly all, of the old ones die before the young become mature enough to spawn. If such a state of affairs exist, of course any catastrophe, such as a destructive winter gale or the freezing over for a long period of the water wherein they lie, by killing all the tender young in a district, will exterminate the breed there, since even if the older ones survive such a shock they would not live long

enough, or at any rate be unable to spawn again, and so fail to start a new generation.

Similarly an unusual attack by natural enemies, or excessive dredging by men, might in one season extirpate the scallops of a whole bed or bay. To its active powers of movement and its migratory habits, the scallop must mainly trust for preservation as a race, and to the fortuitous drifting in of young upon rafts of sea-weed most depleted localities chiefly look for rehabilitation.

Whatever the explanation, the supply has certainly decreased along our coast during the past thirty years, even though at certain points—as in the Peconics—there seems no diminution. The huge, smooth-shelled *Pecten tenuicostatus* of the North, as big as a fruit plate, which formerly abounded on the coast of Maine, has now become so rare as to be a prize in the cabinet of the conchologist rather than an edible commodity—a result unquestionably due to over-greedy catching, and an effective reply to those men who told me that they thought the more the scallop beds were raked the more plentiful the mollusks became. Long Island sound no longer affords profitable fishing, and the depletion there is attributed by the local fishermen to the fact that in culling their dredge-loads the little ones were not thrown back. The same story belongs to New York bay and much of the New Jersey coast. The irregularity in respect to plenitude, and also of the size and fatness of these mollusks in the three localities—Buzzard's bay, Cowesett bay (R. I.) and Long Island—where they are still regularly taken, is steadily complained of.

Scallops are caught by hand-dredging from small sail-boats. The dredges are about thirty inches in width, have a scraper-blade upon the bottom, and in favorable weather several may be thrown over from each boat. In shoal water an iron-framed dip-net is sometimes used on calm days. It is pretty hard work, and entails exposure to very severe weather.

The only edible part of the scallop is the squarish mass of muscle (the adductor) which holds the shells together, and this part is skillfully cut out by "openers," who have their houses at the landing places where the dredgers take their cargoes to be sold. It is the buyer, not the dredger, who "opens" or "cuts out" the meat and prepares it for market. In some places men alone are employed in this work—at others women and girls for the most part, and they will earn from eighty cents to \$1.25 a day. The

work is performed with great dexterity. The motions of an expert opener are but three after the scallop is in hand. The bivalve is taken in the left hand, palm up, with the hinges of the scallop toward the opener's body. The knife—a simple piece of steel ground sharp, and with one end stuck in a wooden handle—is inserted in the opening of the shell furthest from the breast. The upper "eye" is severed through by this movement. A flit at the same moment throws off the upper shell. The second motion cuts the lower fastenings of the eye to the upper shell and takes the soft and useless rim off. The last motion pitches the shell into one barrel and the soft and slimy rim into another, while the eye is thrown into a basin of yellow stoneware holding a gallon. They are then poured from the basin into a large colander, thoroughly washed, placed in clean boxes and shipped to New York and Brooklyn. As little fresh water or ice is placed in contact with the "meats" as possible, as it is thought detrimental to their firmness and flavor. As this is altogether a winter operation, the help of ice in transportation is not usually needed.

There is, or ought to be, no waste in the scallop fishery. On Long Island the refuse is taken by the farmers as manure. These sea-faring agriculturists have always been accustomed to replenish their half-exhausted lands with the scrapings of the beach and with the menhaden and other seine-fish which could be caught plentifully enough for the purpose in the offing—much to the disgust of every stranger who found himself to leeward of their fields. This demand failing, there is always sale for the refuse to the regular fertilizer-factories scattered along the shore.

The shells are preferred above all others by the oyster-planters as "stools" or "cultch" to spread upon their deep-water planting beds as objects upon which the oyster-spawn may "set" and grow. This wise preference is due to the fragility of the scallop-shell, permitting it to break into pieces under the strain of a growing cluster of oysters, each one of which will be benefited by the separation, which frees it from the crowding of its fellows and gives it room to expand by itself into comely and valuable rotundity, instead of remaining a strap-shaped distorted member of a coalescent group. All their shells, therefore, can easily be sold by the openers to the oystermen at from three to five cents a bushel.

The scallop fishery is of small moment in the United States beside the production for market of oysters and clams, and the statistics (for which I am chiefly responsible) are meager, and not later than 1881, though I doubt whether this year's figures would show much difference from the status of five years ago.

Briefly summarized, these show that about 250 men (and for a short season at New Suffolk, Long Island, about 470 women and children, according to Fred. Mather), are engaged in either catching or preparing scallops, using boats and apparatus worth perhaps \$20,000.

The total product is from 70,000 to 75,000 gallons of the edible part, as marketed, worth at first hand from \$25,000 to \$30,000. About one-half of this comes from Peconic bay, and more than half the remainder from Greenwich, Long Island.

—:O:—

SUPER-METAMORPHISM AND VULCANISM.¹

BY THEO. B. COMSTOCK.

IF it be true that metamorphism has converted Archæan sedimentary strata into the crystalline condition in which those beds now usually exist, there can be little doubt that some igneous rocks have had a similar origin. We can not detect the direct evidence of such previous condition in the thoroughly fused masses, but there is in many cases no real proof to the contrary, to say the least. Now, if these simple postulates be admitted, how can we consistently deny the possibility—nay, the probability—of the occurrence of all degrees of metamorphism from the simple baking to the melting effects? Geologists have commonly supposed that a well-defined zone of metamorphism has existed over the earth involving just so much of the sub-stratum of the crust, never passing the boundary set by the lowest member of the Palæozoic series. This view does not comport with the very gradual transitions observable in all other natural products, nor can it be reconciled with the numerous facts which go to prove that the great geologic agents of the past are active now as then, in kind if not in degree.

Really, then, it would be marvelous if extended study of geological history should not reveal fluctuations of the metamorphic zone, above and below the arbitrary stratigraphic boundary adopted in the early days of our young science.

¹ Abstract of two papers read before Section E, A. A. A. S., Buffalo, 1885.